fantinelli
PRESSURE GAUGES AND THERMOMETERS

HART® PROTOCOL PRESSURE TRANSMITTERS *SE 129* SERIES

SE 129 Series Digital •Intelligent Pressure/Differential Pressure Transmitter is a multipurpose digitalized intelligent instrument developed by Fantinelli Srl , including capacitance pressure /differential pressure transmitter and direct-coupled pressure/ level transmitter.

It is made on the basis of the mature and dependable sensing technology, combining the advanced single-chip computer technology and sensor digital convert technology. 16-bit single chip is adopted as its core element, with its powerful function and high-speed calculation capacity ensuring the excellent quality of the transmitter. The whole design frame focuses on its dependability, stability and high precision and intelligentization, meeting the growing demand in on-site industrial use. To get this goal, digitalized signal processing technology is used in the software to ensure its disturbance capacity and zero point stability. Meanwhile, it has the Zero Stability Capacity (ZSC) and Temperature Supplementing Capacity (TSC). The powerful interface functions guarantees an excellent interactivity with no need of manual operator. Its digitalized meter head can display 3 physical parameters including pressure, temperature and current, and 0-100% analogue indications. Keystroke operation can finish the basic settings of zero shift, range setting, damping setting under the circumstance of no standard pressure, greatly convenient for the onsite debugging.

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Cod. fisc./P.iva 00039940127
r.e.a. Varese 54140 – reg. imprese Busto A. n°9916
cap.soc. € 52.000,00 int vers.

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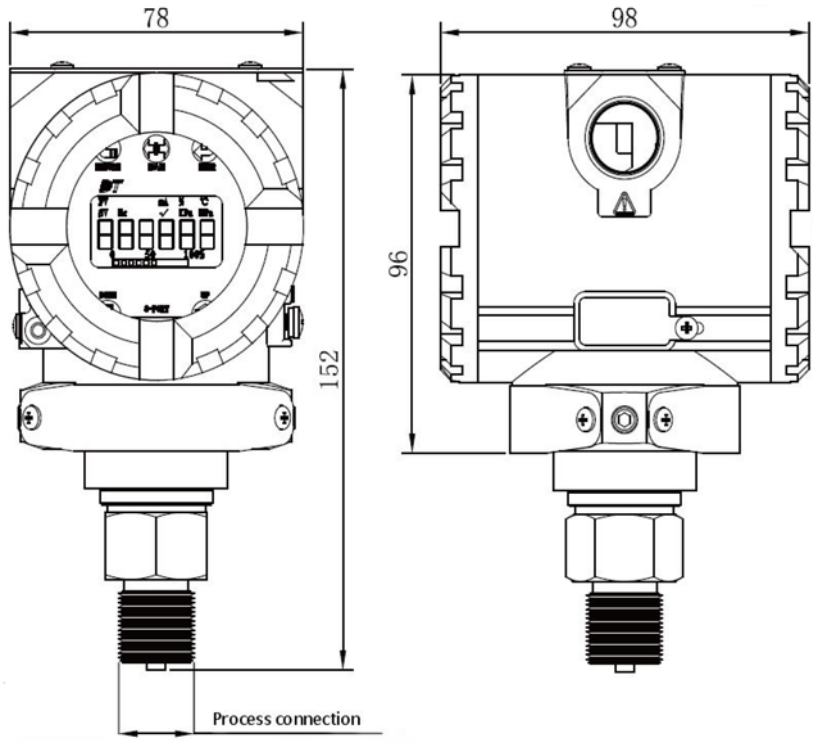
SE 129-R

Relative pressure transmitter

Case	*Aluminium case IP65 Ex.proof revolving 360°*
Accuracy	*Class +/- 0,1% of sensor span* (Class 0,075 on request if available)*
Output	*4/20 mA with Hart® protocol superimposed*
Sensor	*Silicon*
Process connection	*1/2"NPT or BSP male*
Wetted parts	*AISI316*
Display	*LCD display with safety Glass*
Temperature	*Environment -20-85°C* *Agent 25-100°C*
Working voltage	*14-36VDC , standard 24VDC* *±5% with ripples less than 1%*
Overpressure	*2 times of full sensor span*



Available Sensor span

0/3 kPa	*---0/10 kPa**	*0/10 kPa*	*---0/35 kPa*
0/35 kPa	*---0/100 kPa*	*0/100 kPa*	*---0/200 kPa*
0/200 kPa	*---0/700 kPa*	*0/700 kPa*	*---0/1,7 MPa*
0/1,7 MPa	*---0/3,5 MPa*	*0/3,5 MPa*	*---0/7,0 MPa*
0/7,0 MPa	*---0/35 MPa*	*0/35 MPa*	*---0/ 60 MPa*

****sensor span 0/3—0/10 Kpa available with accuracy class 0,25***

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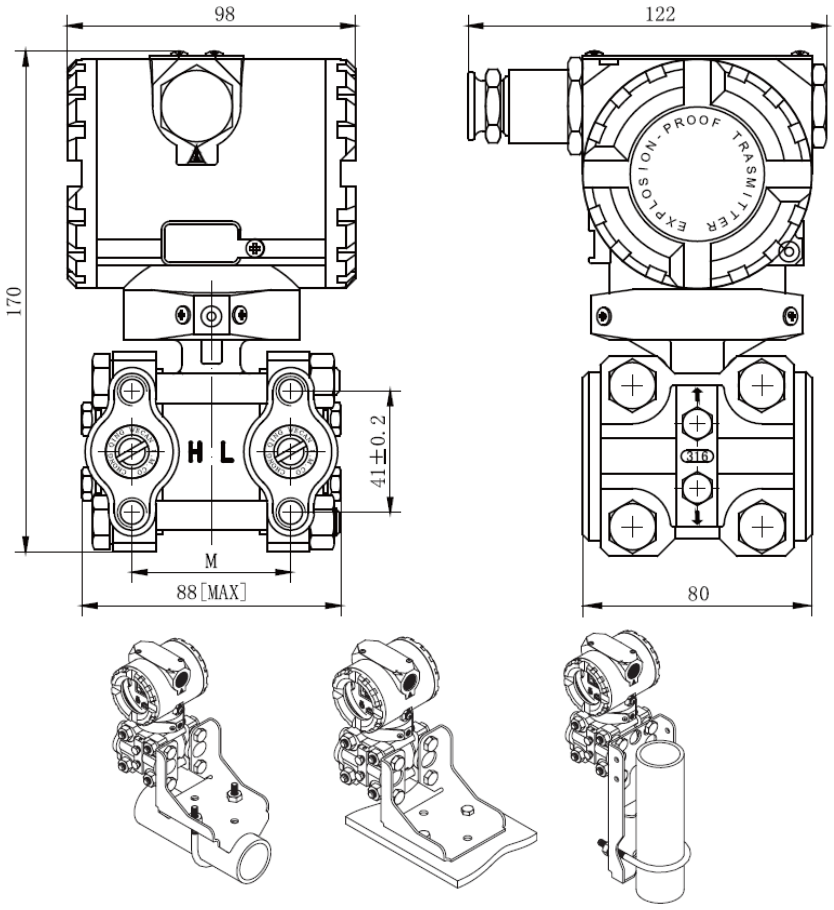
SE 129-D

Differential pressure transmitter

Case	*Aluminium case IP65 Ex.proof revolving 360°*
Accuracy	*Class +/- 0,1% of sensor span (Class 0,075 on request if available)*
Output	*4/20 mA with Hart® protocol superimposed*
Sensor	*Capacitive*
Process connection	*2x1/4"NPT-Female*
Wetted parts	*AISI316 connection and diaphragm* *Monel or Hastelloy diaphragms on request*
Display	*LCD display with safety Glass*
Temperature	*Environment -20-85°C* *Agent 25-100°C*
Static	*Up to 40 MPa*
Mounting	*2"pipe or Surface Bracket*



Available Sensor span

1	*0/0,06 ------ 0,3 kPa*	*Static 0,4 MPa*
2	*0/0,25 ----- 1,5 kPa*	*Static 0,4 MPa*
3	*0/1,20 ----- 10 kPa*	*Static 40 MPa*
4	*0/6 --- ---- 40 kPa*	*Static 40 MPa*
5	*0/30 --- ---- 180 kPa*	*Static 40 MPa*
6	*0/160 ----- 1000 kPa*	*Static 40 MPa*
7	*0/400 ----- 2500 kPa*	*Static 40 MPa*
8	*0/1600---- 8000 kPa*	*Static 40 MPa*
9	*0/4000 --- 25.000 kPa*	*Static 40 MPa*
0	*0/7000 --- 40.000 kPa*	*Static 40 MPa*

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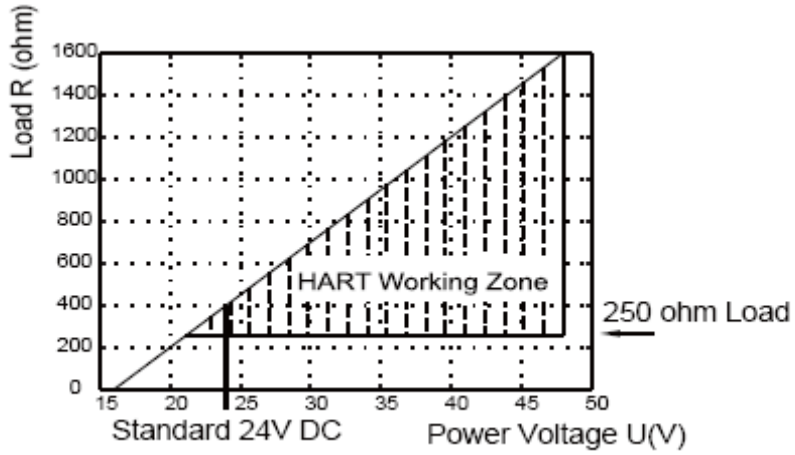
Note: The users are recommended to use in the above ranges, and adopt 100:1 in the extreme state.
The compressed range adopts the following formula to calculate its precision:

$$0.05+ (0.05\times\frac{\text{Rating Range}}{\text{Setting Range – Zero Point Transfer Amount}}) \% F.S$$

A.1 Functional Indices
A.1.1 Technical Indices of SE 129 Series Digital•Intelligent Pressure/ Differential Pressure Transmitter

Functional Specifications
(Reference conditions: no-transfer state, Silicone Oil Fill Fluid, 316L Isolating Diaphragm)
Output Signal: 4-20mA DC/HART Protocol digital communications
Transmission Mode: 2-wire
Load Characteristic Chart:



Precision:
Linear Output: ±0.075 - ±0.1% (Rangeability is 1:1), including the linear, differential and repeated errors)
Square Root Output: At the output pressure of 4 – 100% , the value is ±(0.2% marked range + the upper limit of 0.05%)
Stability: for DP Code 3,4 and 5, it is ±0.2% of the maximum range, for other codes, ±0.25% of the maximum range.
Humidity: relative humidity 0 - 100%
Startup Time: at the minimum damping, within 2 sec.
Cubage absorbing amount: less than 0.16cm3
Damping: electrical damping is 0-32 Sec.

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In addition, the sensor has an extra 0.2 sec invariable damping time (0.4 sec for range 3).

Static Pressure effect (DP transmitter)
Zero Error: as for 14MPa, it is ±0.25% in the maximum; For the range code 3, ±0.5% of the maximum. It can be calibrated through zero point adjustment.
Range Error: it can be calibrated to ±0.25% of the input reading for each 6Mpa; or for range code 3, it is ±0.5%. This error can be eliminated before mounting.

Static Pressure effect (HP transmitter)
Zero Error: as for 32MPa, it is ±1.0% in the maximum; It can be calibrated through zero point adjustment.

Temperature Effect
· Zero point error at the maximum range:
For each 56°C , it is±0.5% of the range. The overall effect includes range error and zero point error: for each 56°C , it is±1.0% of the range.
For range No. 3, the effect is doubled.

· Zero point error at the minimum range:
For each 56°C , it is±3.0% of the range. The overall effect includes range error and zero point error: for each 56°C , it is±3.5% of the range.
For range No. 3, the effect is doubled.

Vibration Effect: at a frequency of 0 – 200 Hz, each g on any directions
is the upper limit value of ±0.05%.

Power Effect: less than 0.005%/V of marked range

Mounting position effect: zero point excursion not more than (0.25kPa),
This error can be eliminated with no influence on the range.

Electromagnetic disturbance/ radioactive frequency effect: test is done according to SAMA PMC33.1 in the range of 20~1000 MHz, the magnetic strength can be as high as 30V/m.

Structural Specifications:
Materials Touching Agents:
Isolating diaphragm: 316L stainless steel, Hastelloy C-276, Monel alloy or Tantalum (optional)
Vent/drain valve: 316 stainless steel, Hastelloy C-276, Monel alloy or Tantalum

Flange and Connector: 316 stainless steel, Hastelloy C-276, Monel alloy or Tantalum

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- O-ring touching agents: fluorine rubber, Buna-N rubber (optional)
- Fill fluid: Silicone Oil
- Bolt: carbon steel plated with cadmium
- O-ring sealing: Buna-N rubber, fluorine rubber (optional)
- Painting: polyurethane
-

Connector: for the transmitters with range No. 3,4 and 5, the center connection holes distance between two flanges is 54 mm, with the upper hole part of NPT1/4-18; for the transmitters with range No. 6and 7, they 56mm and NPT1/4-18; for range No.8, they are 57.2mm and NPT1/4-18.

For the transmitters with range No. 3,4 and 5, pressure-introducing hole of the 2 connectors is NPT1/4-14, the flange connector can be turn over to have the center distances of respective 50.8mm, 54mm or 57.2mm.

Electrical Connectors: with the terminals for on-site test Weight: excluding optional pieces, AP, DP, GP and HP weighs respectively 2.4 kg.

A.1.2 Usage Conditions:

Power Supply: 16V-48V DC intrinsically safety type explosion-proof products are required to get a power supply from the corresponding safe barrier (Standard 24 VDC)
Using Environment Of Product
Using Temperature: -20°C - +80°C
Storage Temperature: -40°C - +104°C
Humidity: 0 - 90%
Using environment conditions for explosion-proof product:
Humidity: -20°C - +40°C
Relative Humidity: 5% - 95%
Atmosphere Pressure: 86 - -106kPa

Parameters for intrinsically safety type outsourcing safe barrier :
$U0 \leq 28V$ DC,
$I0 \leq 30mA$,
$P0 \leq 0.84W$

A.2 Accessories

Our digital•intelligent transmitter is attached with the following accessories for the user's convenience.
User's Manual 1 copy
Mounting Bracket 1 set *
M10 Bolt 4 pieces*

**(Note: direct-coupled is not attached with mounting bracket and M10 bolts)*

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A.3 Precautions

1. Correctly wiring as per the requirements described in the instructions
2. This product is precise measuring instrument. Do not beat it, strike it, or forcedly bind it, nor dismantle it, thrust the pressure introducing hole or metal diaphragm with sharp articles.
3. The transmitter should be mounted in a place where is ventilated, dry, free from corrosion and cool.
4. If the measurement agent is a viscid fluid or the one with floating granules, avoid the diaphragm being struck and the probe being jammed.
5. It is prohibited that the system is overloaded, exceeding the limitation stipulated in the instruction.
6. Keep the cable connector being sealed to avoid letting in the water or humidity, which may affect the integral performance and longevity.
7. In the case of abnormal output, shut down the transmitter for a check. If it is due to the product quality problem, please bring the product with the qualification certificate back to our company for a maintenance or change.
8. With the constant improvement of the product technology, no separate notice will be given concerning the alternation of product performance.

A.4 Additional declarations to SE 129 transmitter

1. Keys Functions

1) The external key is used to calibrate the transmitter at no differential pressure. So when press down this key, the differential pressure to the transmitter must be zero.
2) If press down “DOWN” buttons for at least 5s, Zero setting will be performed.
3) If press down “MOVE” and “DOWN” buttons for at least 5s, the setting of lower range value will be performed.
4) If press down “UP” buttons for at least 5s, the setting of upper range value will be performed.

2. Engineering unit

Our transmitter supports up to 18 units. These units are: "kPa", "MPa", "mA", "%", "□", "InH2O","InHg","FtH2O","mmH2O","mmHg","PSI","Bar","mBar","g/cm2","kg/cm2", "Pa","Torr", "Atm".But the latter 13 units can’t be display on the LCD, so the LCD only displays the code.
According to HART protocol, followings are the pairs of code and unit :
1--"InH2O",2--"InHg",3--"FtH2O",4--"mmH2O",5--"mmHg",6--"PSI",7--"Bar",8--"mBar", 9--"g/cm2",10--"kg/cm2",11- "Pa",13--"Torr", 14--"Atm"
When changing unit, the corresponding unit will occur on the LCD, except for that the unit is one of the latter 13 units. In case of that, the HART unit code will be displayed on the LCD.
When unit has been changed for pressure, the range values of transmitter will be changed correspondingly.

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